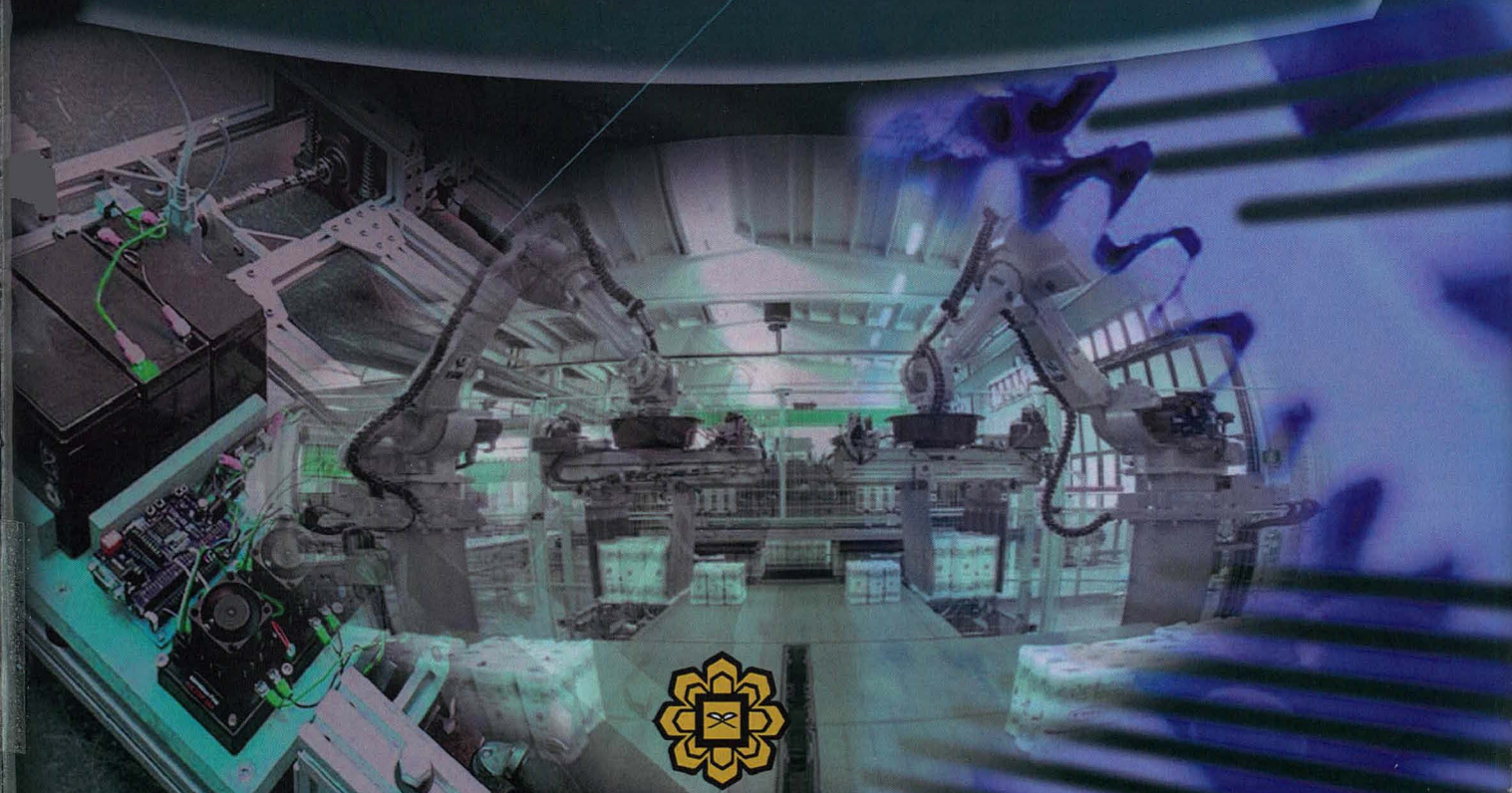
MECHATRONICS BOOK SERIES

CONTROL AND INTELLIGENT SYSTEMS

Momoh Jimoh E. Salami
Abiodun Musa Aibinu
Yasir Mohd Mustafah



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EDITOR

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Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543
EMAIL: iiumprinting@yahoo.com

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Chapter 43
Book Shelving Robotics

M. J. E. Salami[1,a], Mohd Farid Md Alias[2,b], Nurul Izzah Sidek[3,c], Mohamed Mousa[4,d]

[1,2,3]Department of Mechatronics Engineering
International Islamic University Malaysia (IIUM)
P O Box 10, 50728, Gombak, Malaysia
[a]maibinu@iium.edu.my

43.1 Introduction

Library books are generally organized on the library shelves according to their subjects with each book has its own unique call number. Some library books are also equipped with RFID tags for stock management and location tracking. Books that are already read by the library users would commonly be left on the tables or put into the trolleys. They would then be placed back to their original shelves in the correct order by the library patrons.

Book shelving might be performed at the start or at the end of the library operating hours. Such task could take minutes or even hours depending on the number of unshelved books. As the library patrons continuously shelve the books one by one, their attention span toward the task could degrade over time. Consequently some books might be possibly placed at the wrong places as human mistakes might occur. Other library users would then be unable to find the exact locations of the misplaced books. Additionally, the amount of staff time dedicated to shelve the books could instead be useful for other library-related tasks with higher productivity. Thus, by having a reliable automated storage and retrieval system which can replace humans in shelving library books, the process of shelving books could be achieved in a shorter time with lesser errors. Moreover, a library could beneficially obtain additional manpower to perform other more important jobs rather than to focus on such repetitive book shelving duty. Due to the physical nature of the task, robotics provides ideal solution to the system. Manipulator arms can be assigned to lift books to or from the shelves and conveyors.

43.2 Robotics for Book Shelving

The Joe and Rika Mansueto Library's ASRS of Chicago University

The Joe and Rika Mansueto Library's of Chicago University is one of few universities in the world which employs automated storage and retrieval system (ASRS) for its material collections. The system would allow library users to order specific reading materials and collect them at the collection counter without ever needing to manually search them at their respective shelves. "Upon request, a robotic crane will retrieve materials stored in the ASRS almost instantaneously" (The University of Chicago Library, 2011) as shown in Figure 43.1.